

FIGURE 1

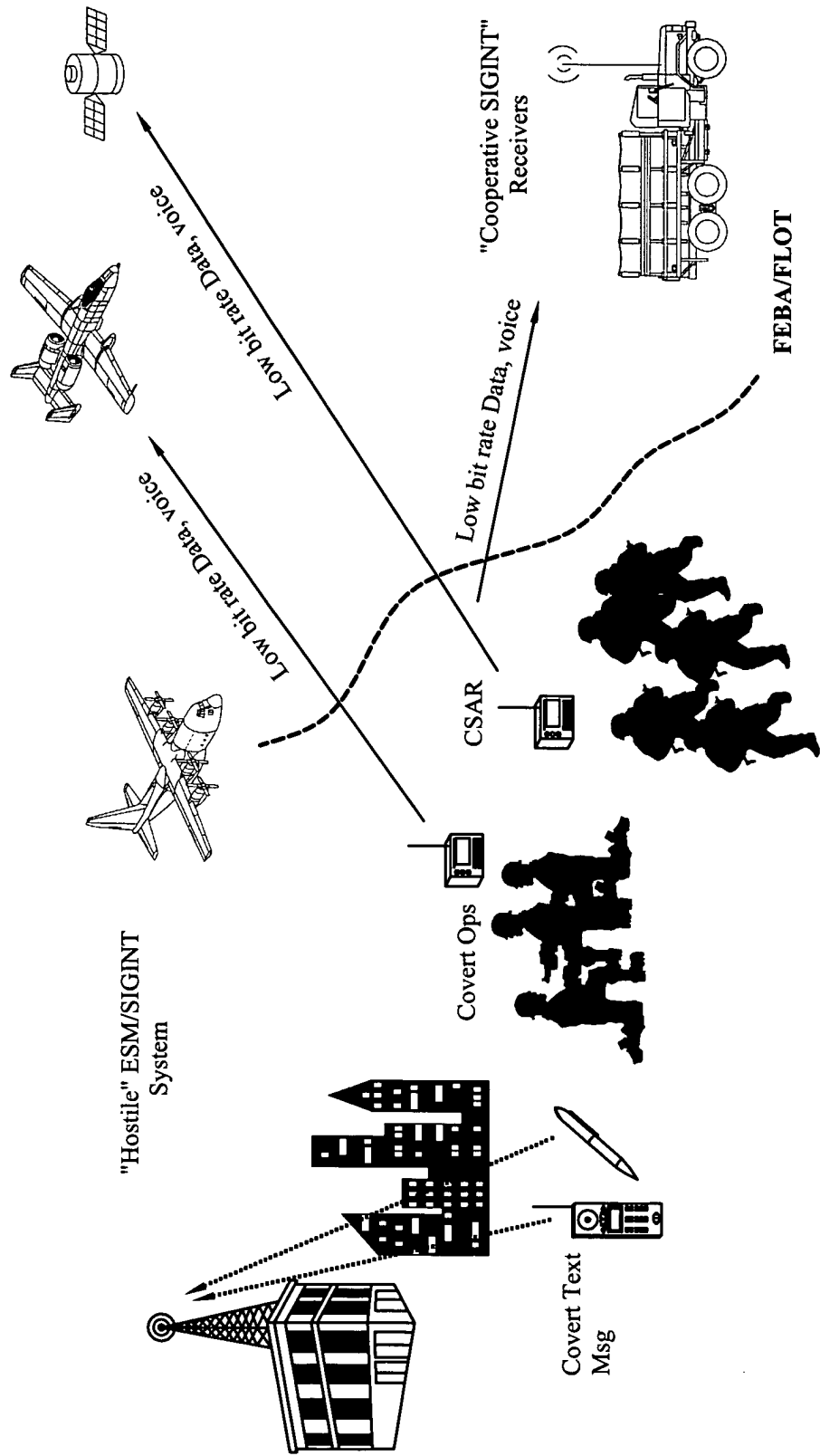


FIGURE 2

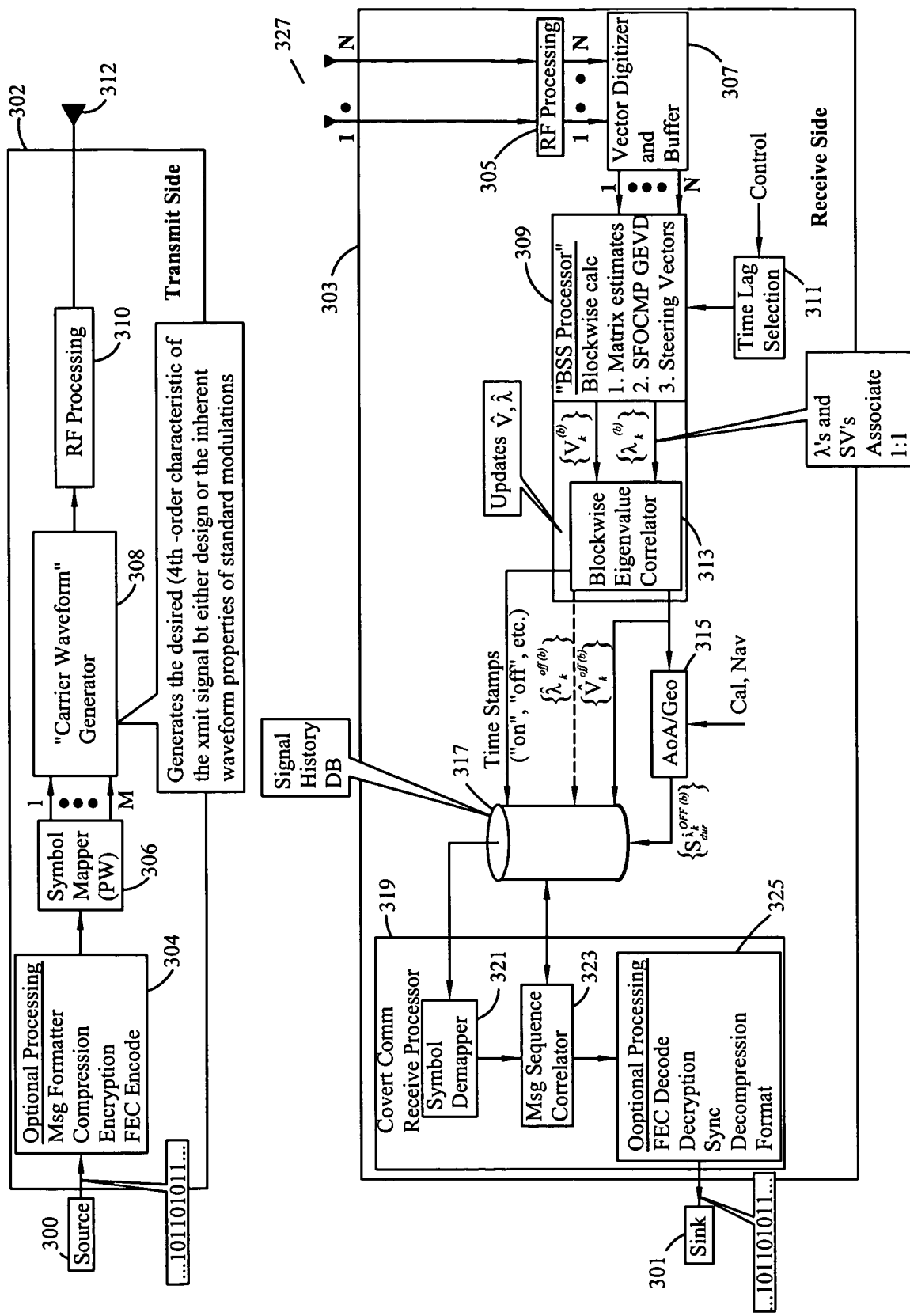
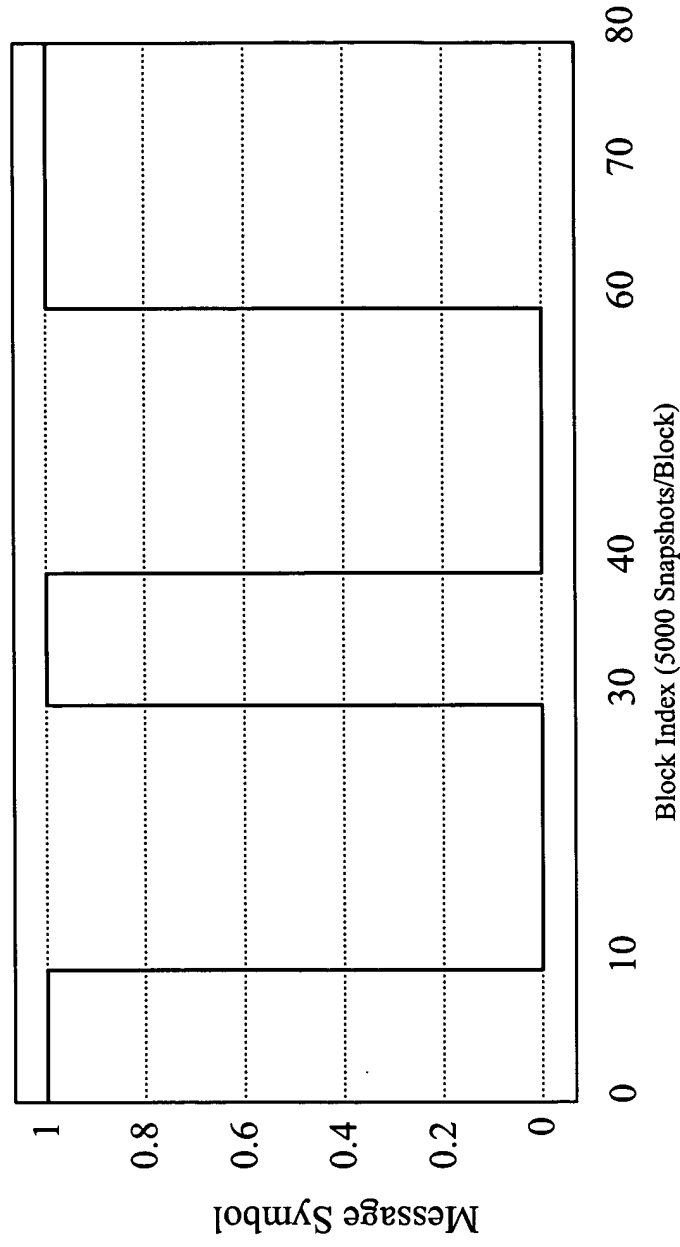


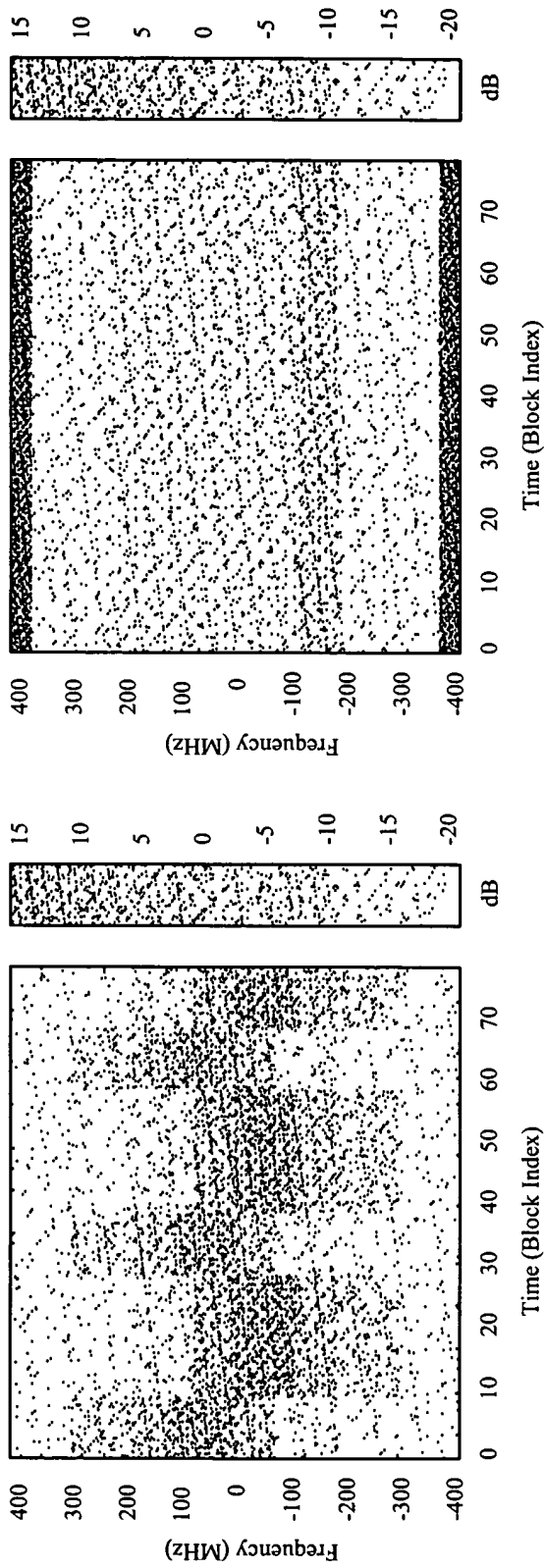
FIGURE 3



Covert message sequence: **1 0 1 0 1 1** where symbols are:  
**1**: 10 5k-sample blocks (50000 samples from array)  
**0**: 20 5k-sample blocks (10000 samples from array)  
Covert baseband waveform consists of "narrowband"  
random noise (Laplace distribution)

FIGURE 4

Typical ESM/SIGINT spectral monitor output:



Spectrogram of covert emitter message and symbol boundaries defined by frequency offsets at the transmitter.

FIGURE 5a

Time-varying spectral pattern of covert emitter is buried in interference and noise (SINR is -10 dB) making it very difficult to detect.

FIGURE 5b

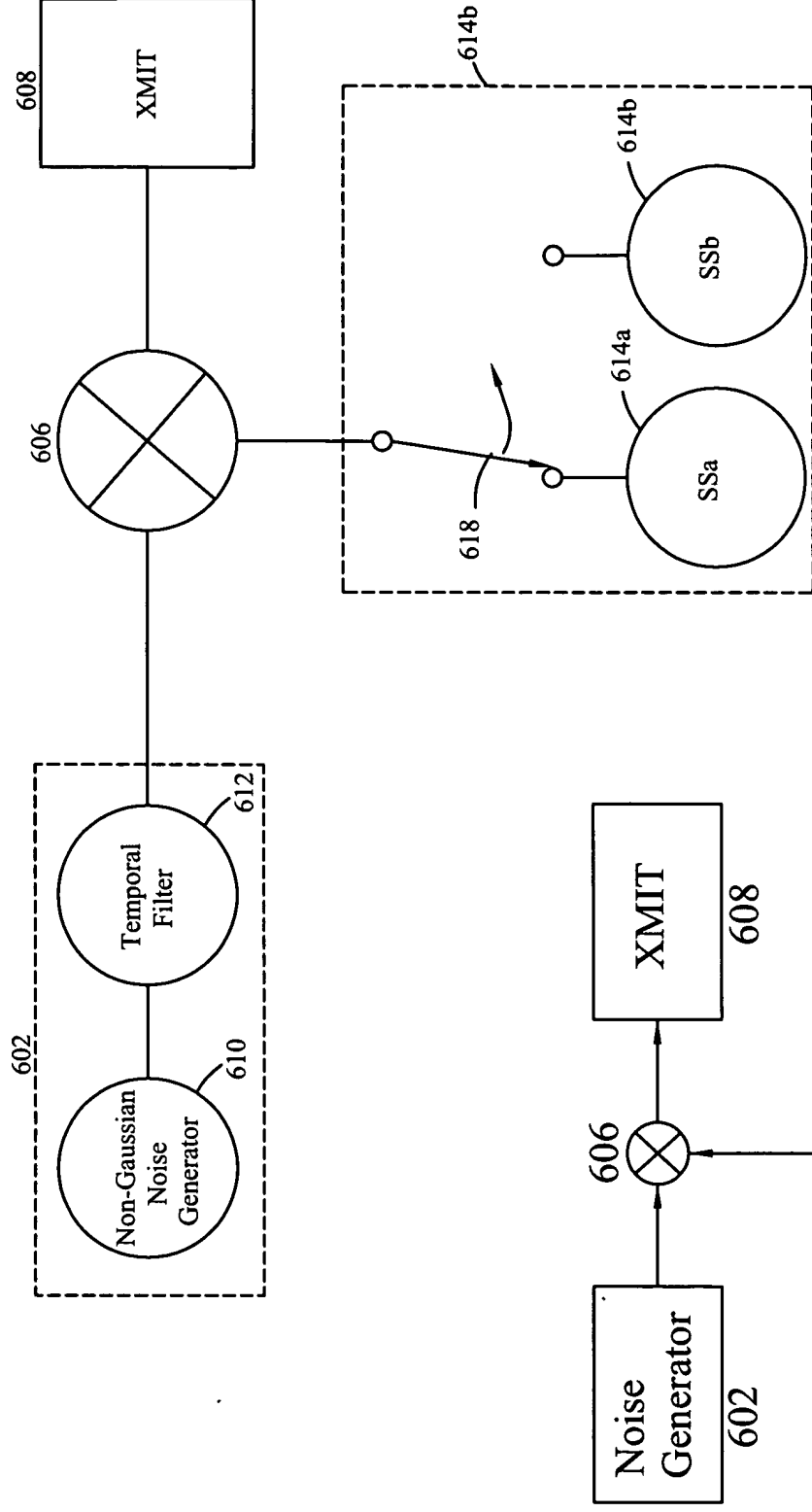


FIGURE 6a

FIGURE 6b

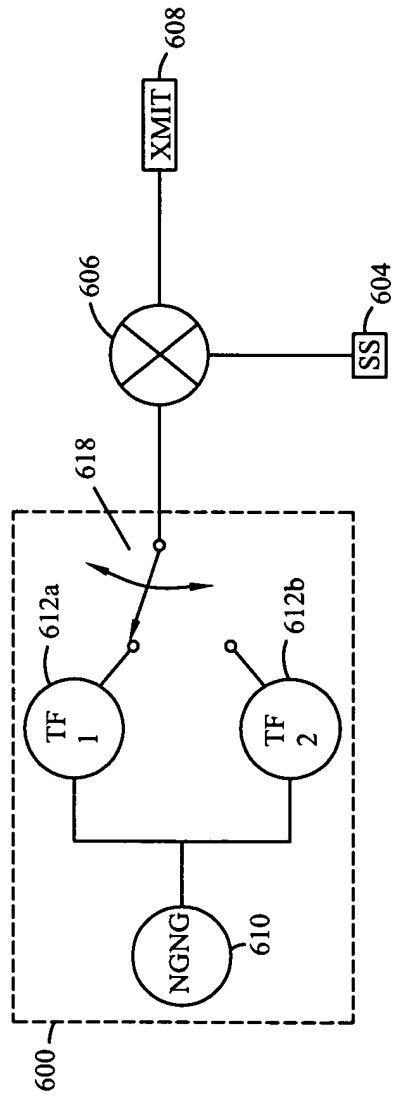


FIGURE 6c

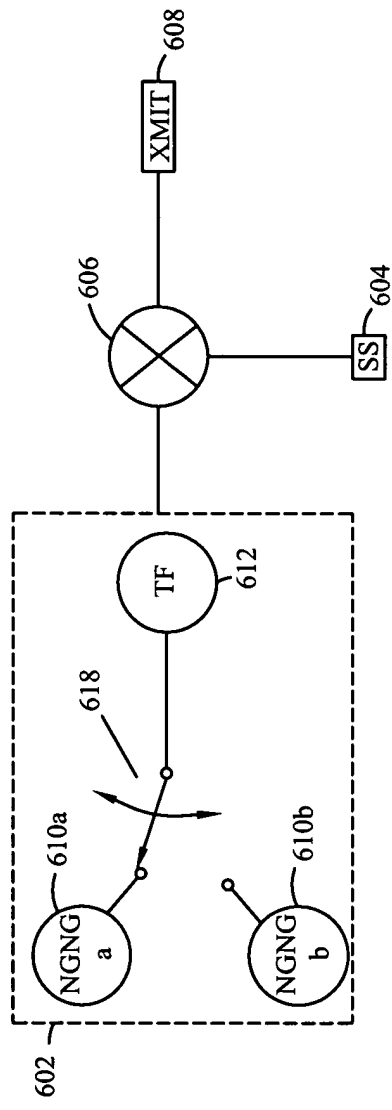
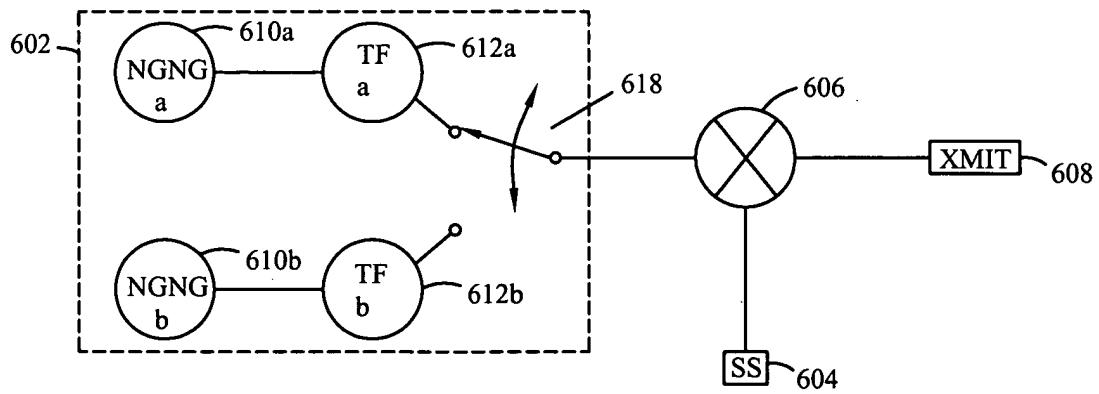
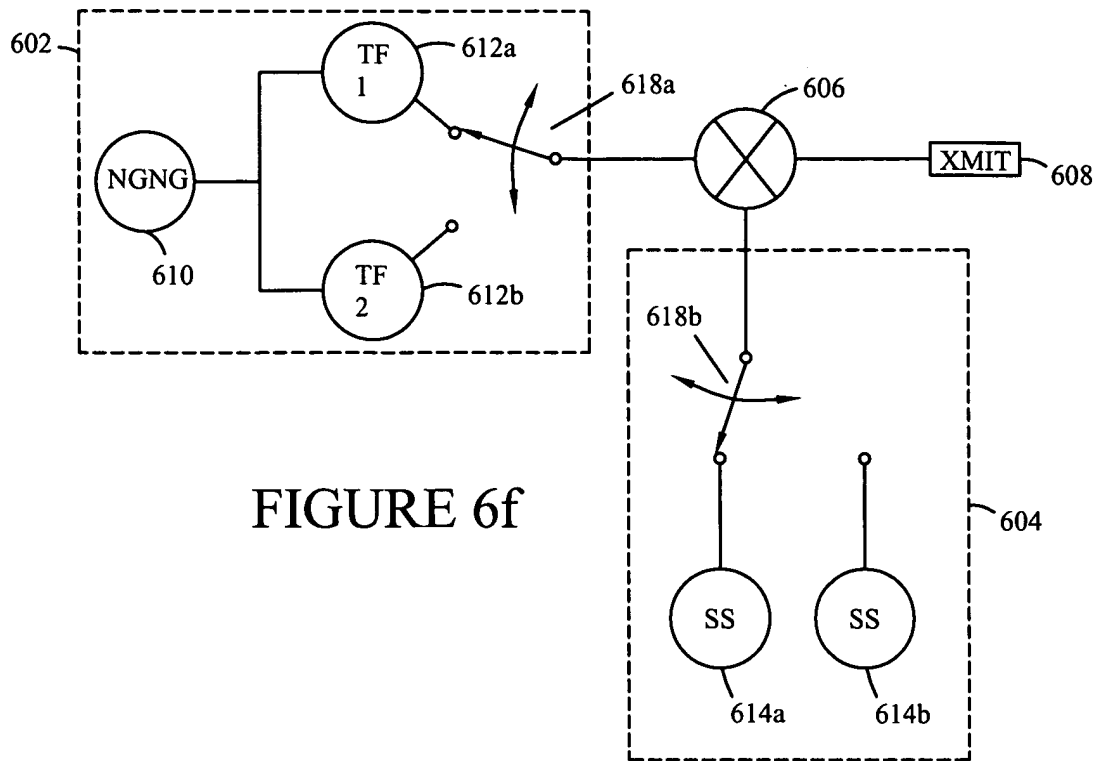


FIGURE 6d





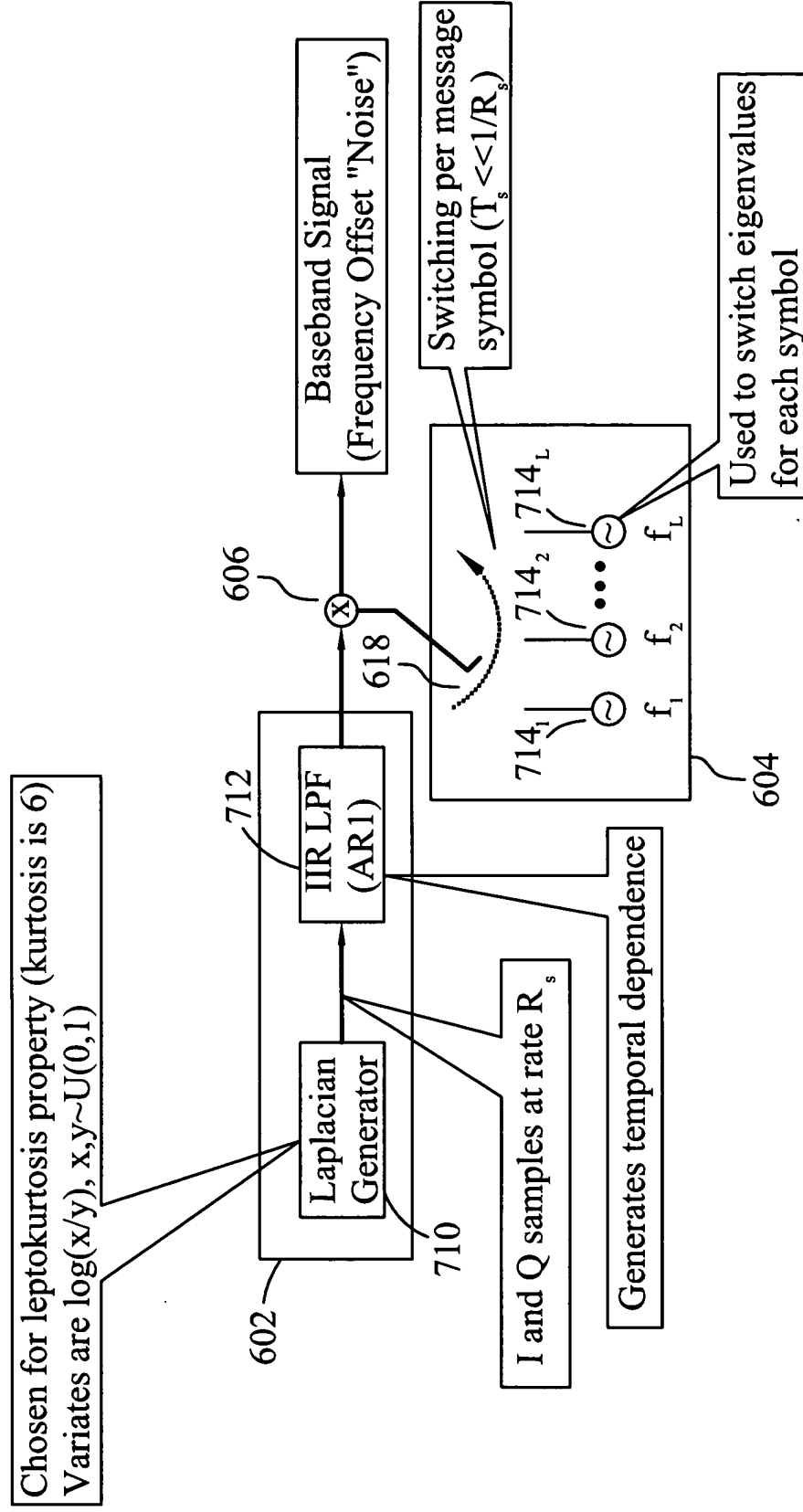
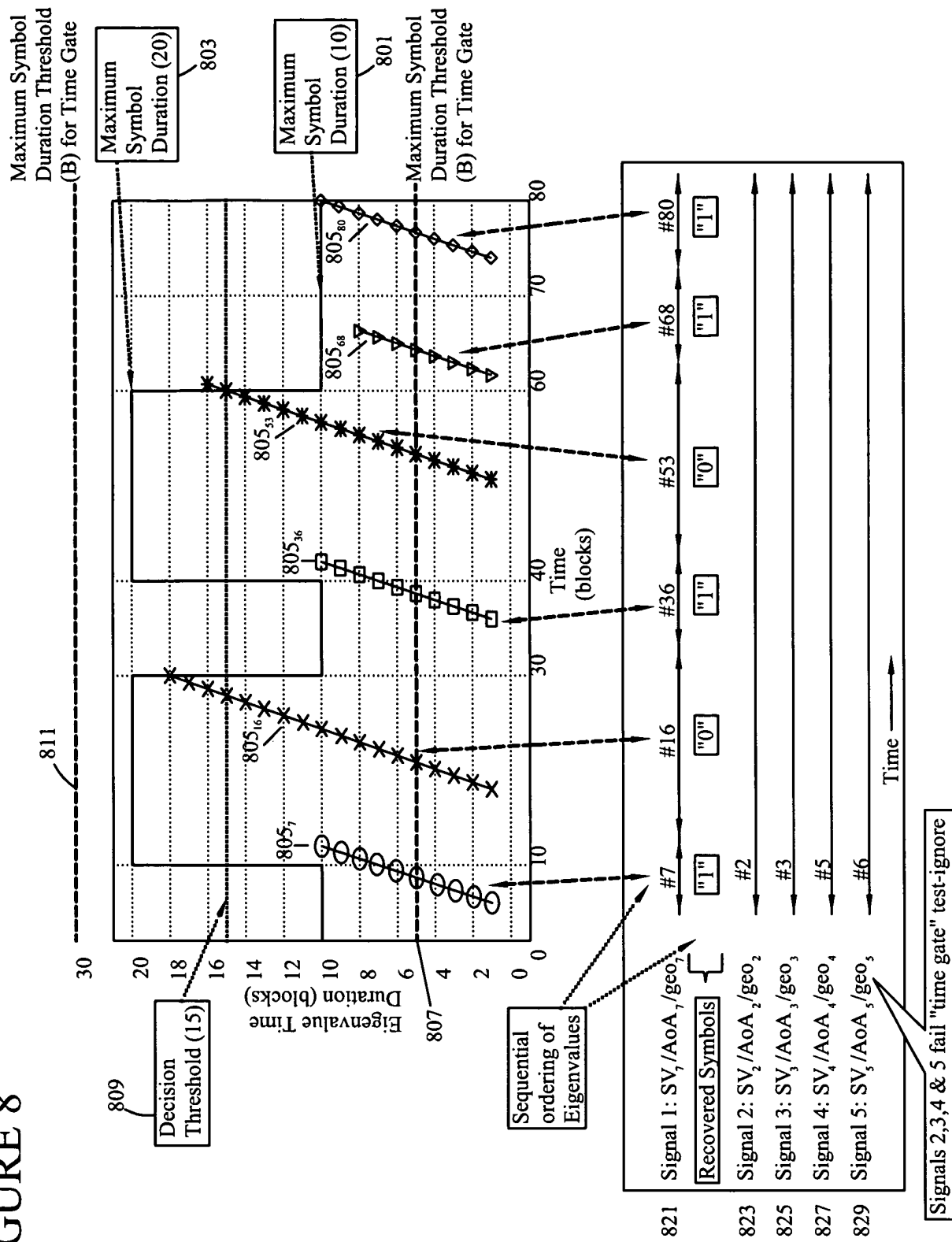


FIGURE 7

# FIGURE 8



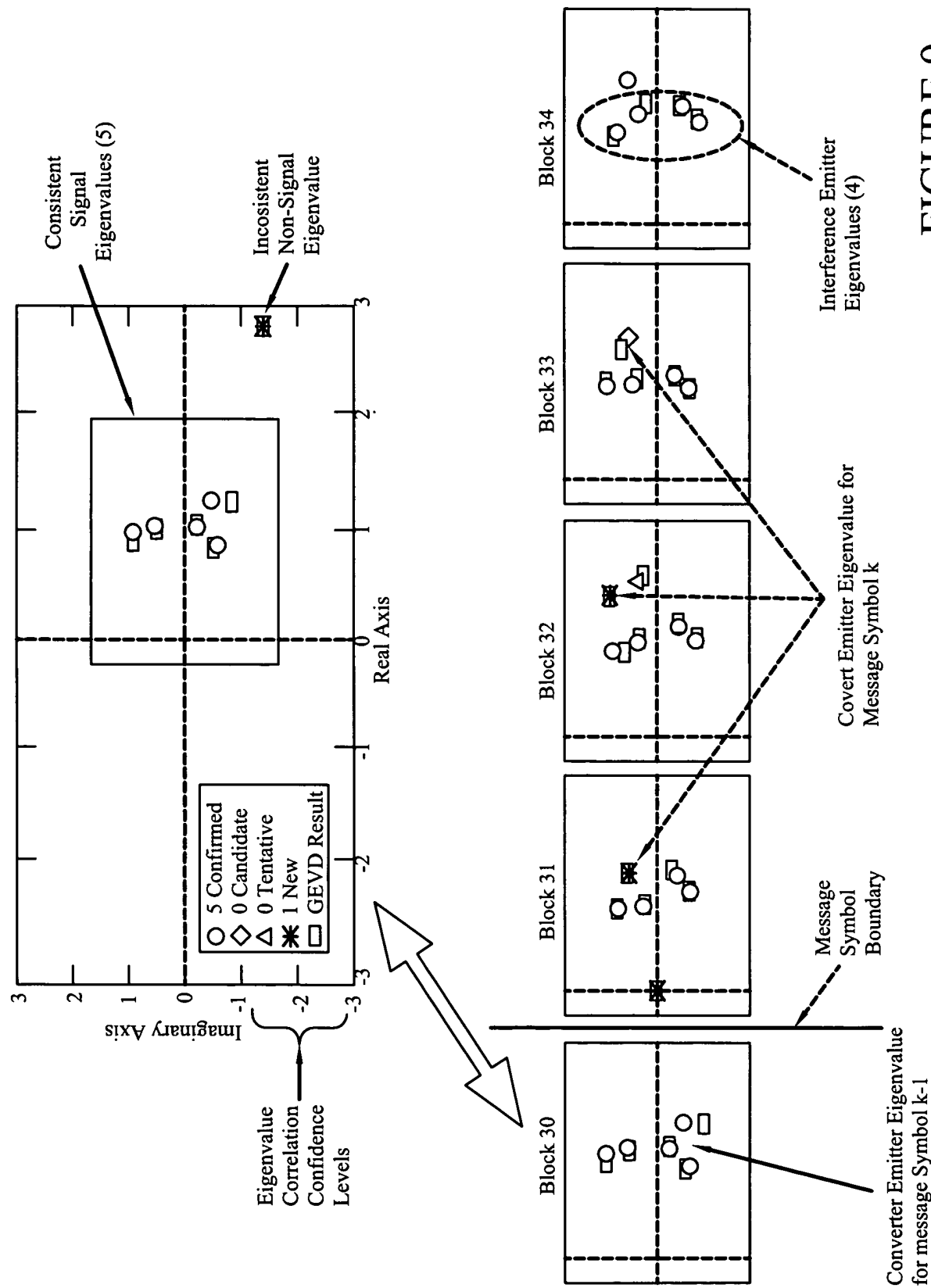


FIGURE 9

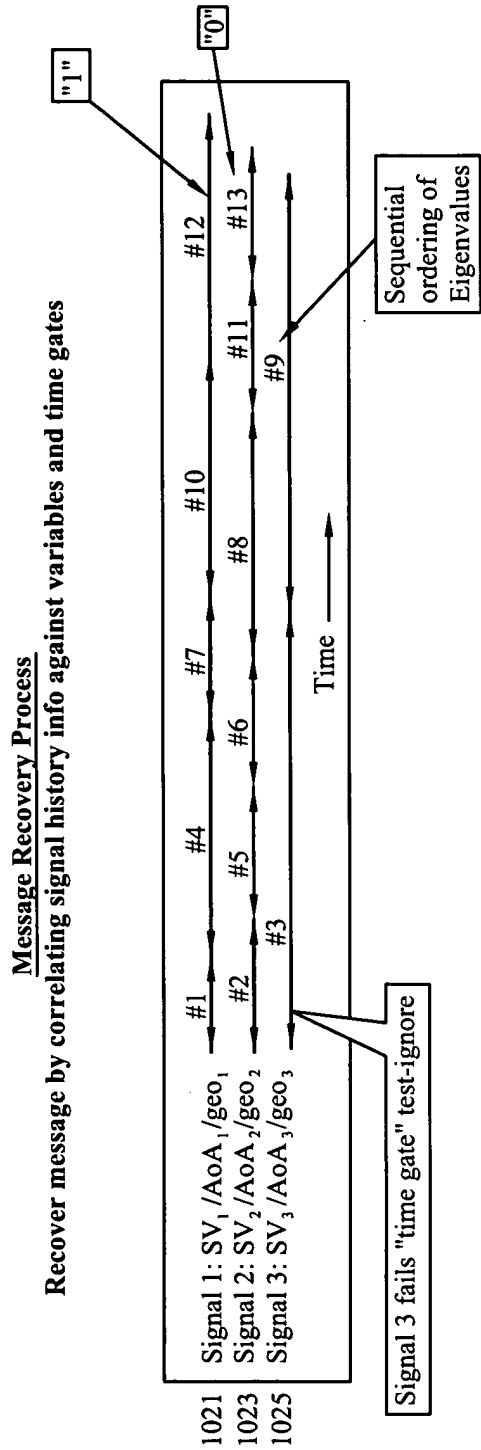
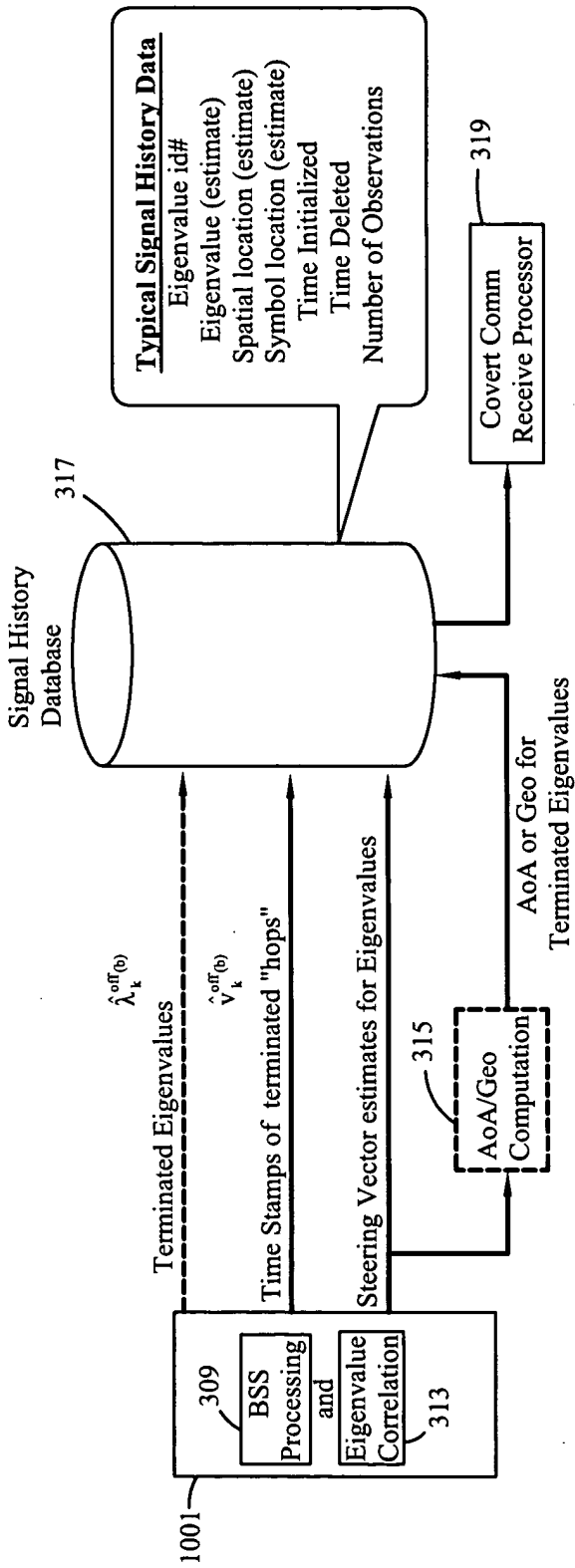


FIGURE 10

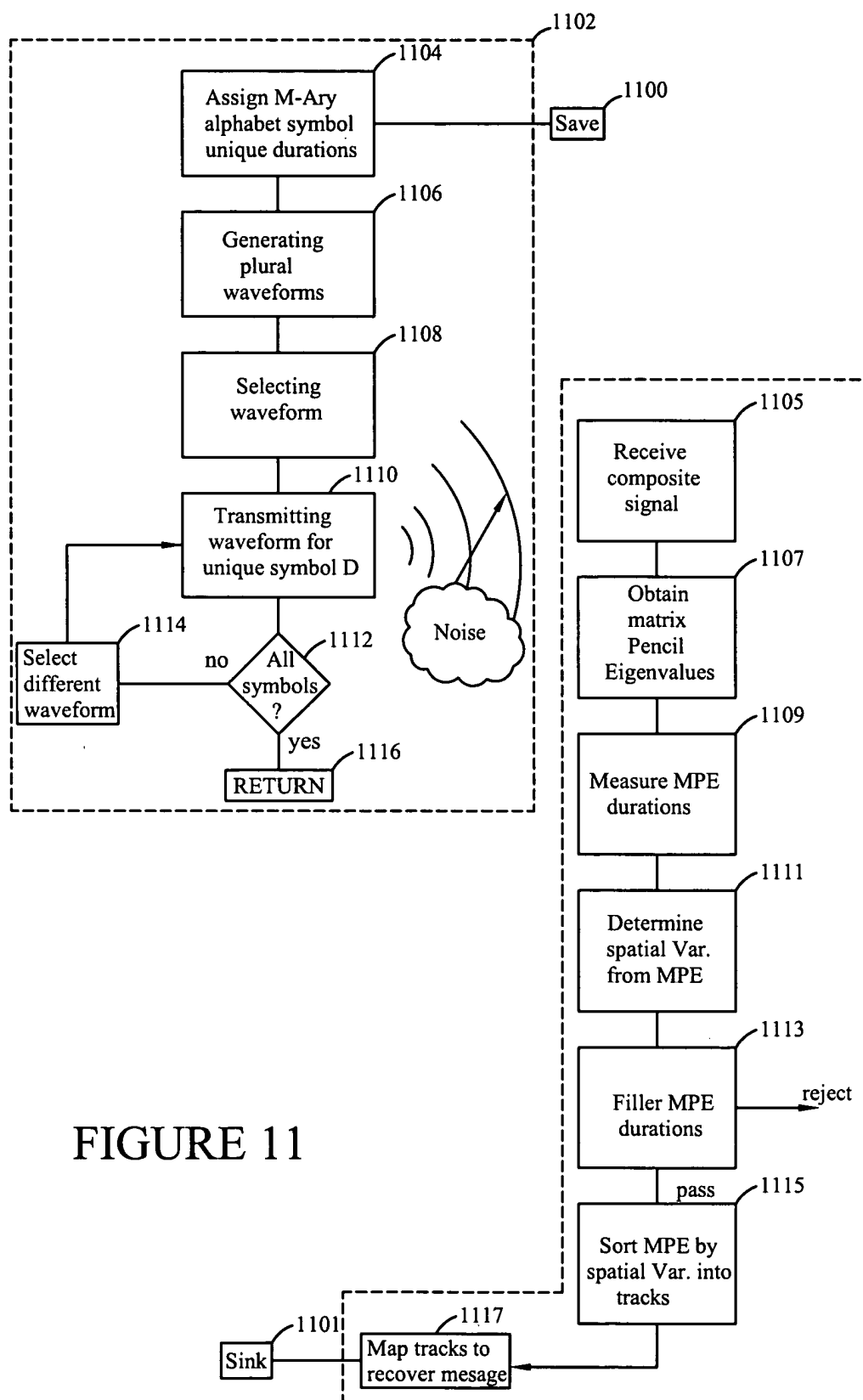
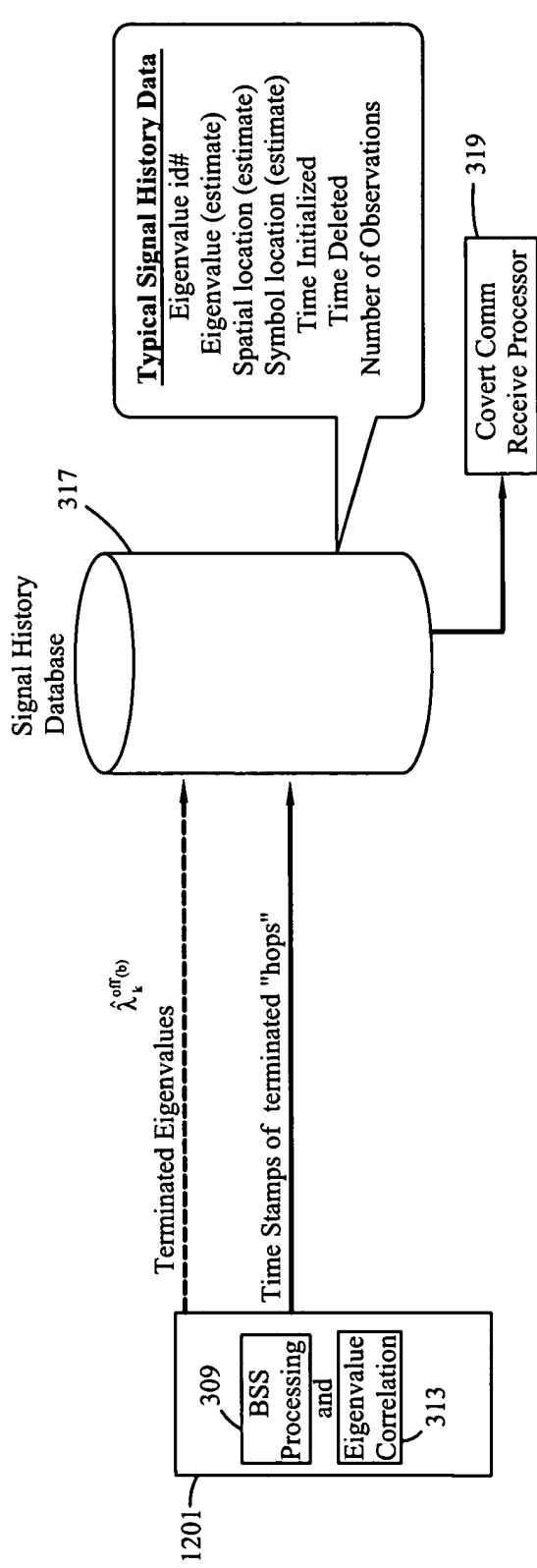
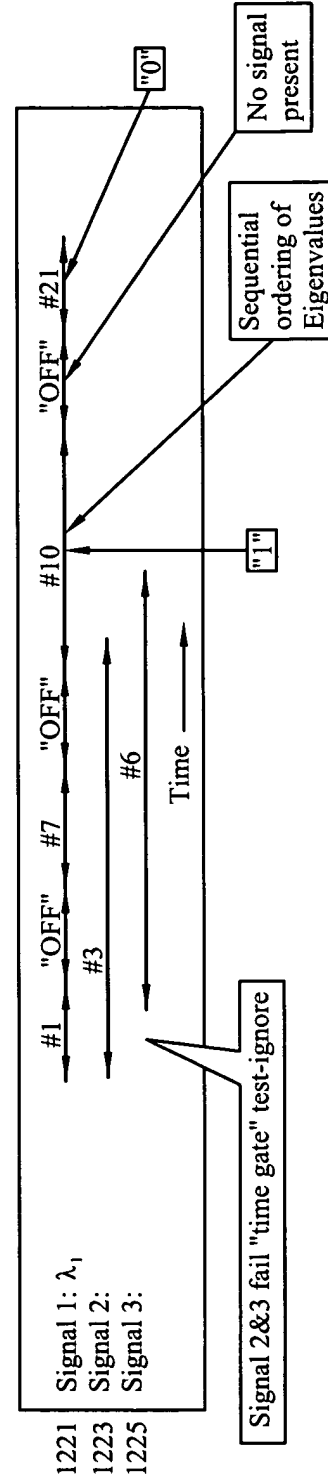


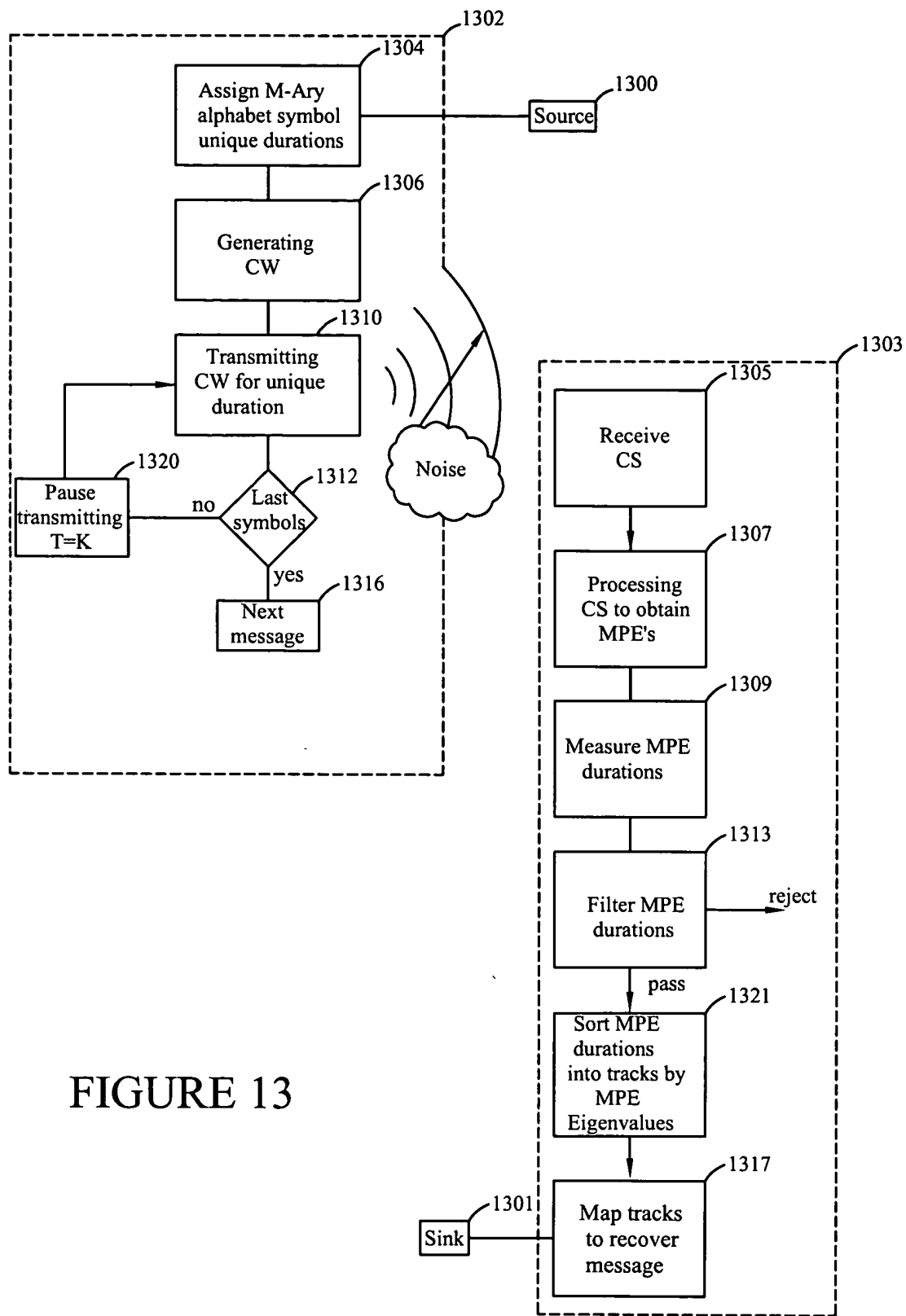
FIGURE 11



**Message Recovery Process**  
 Recover message by correlating signal history info against variables and time gates



**FIGURE 12**



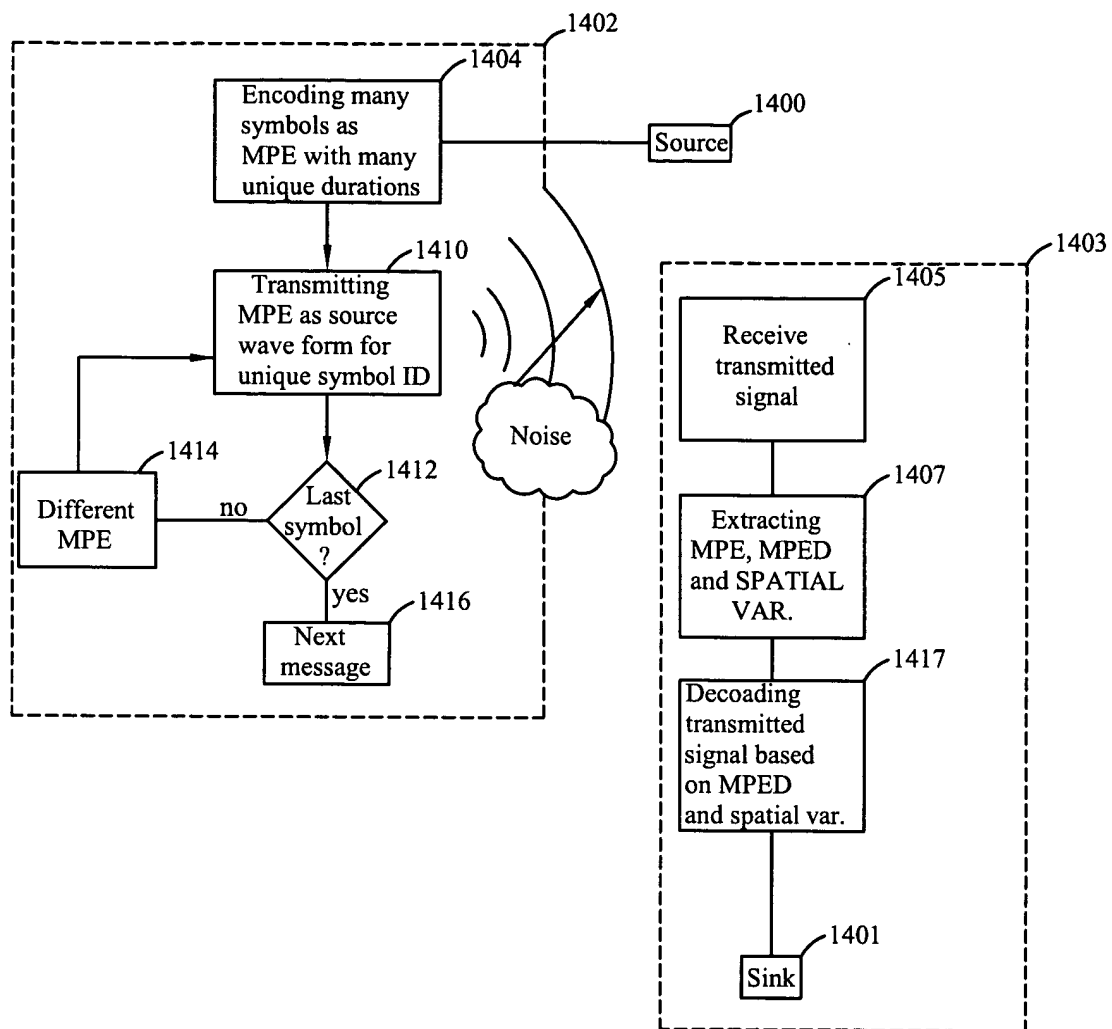


FIGURE 14



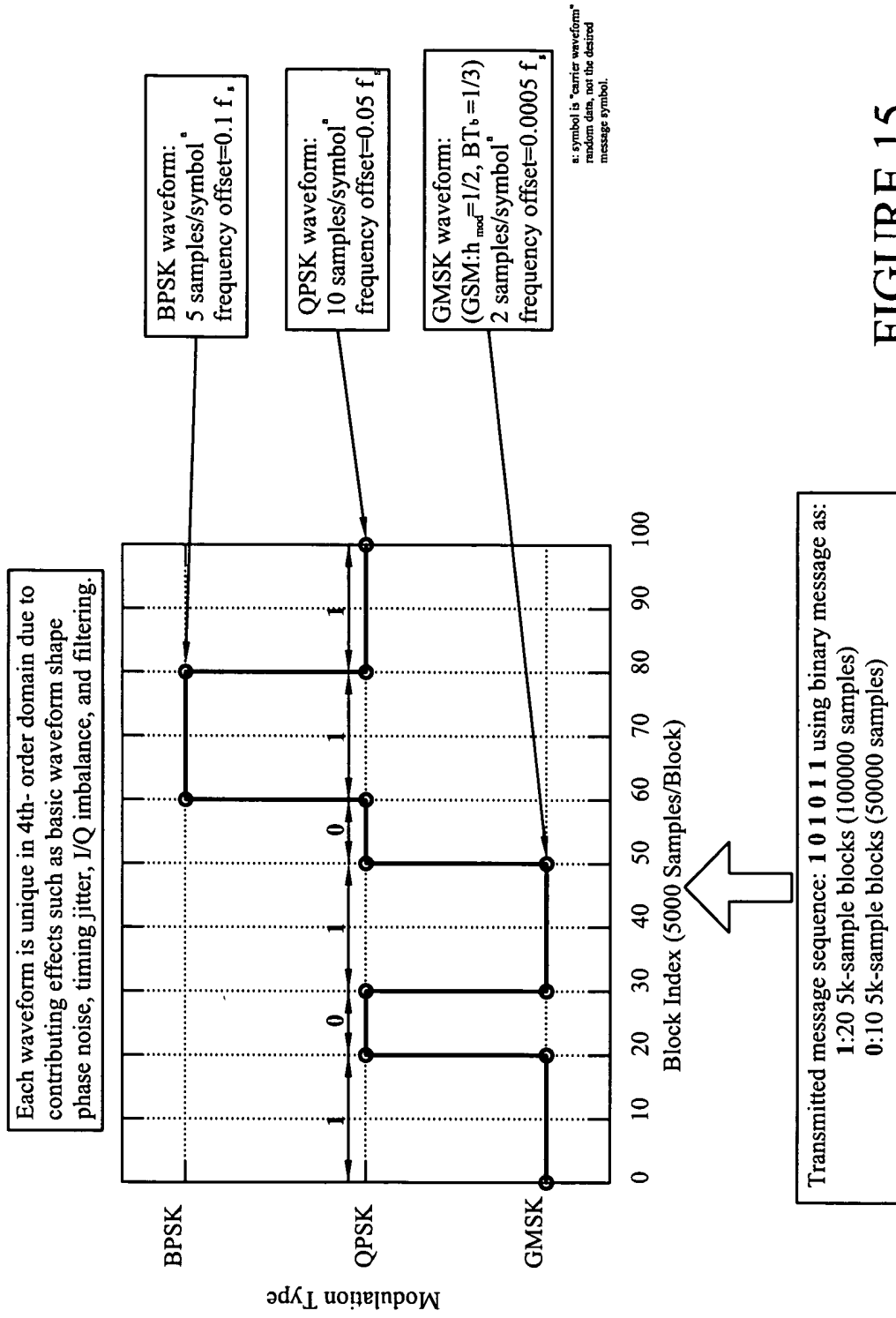


FIGURE 15

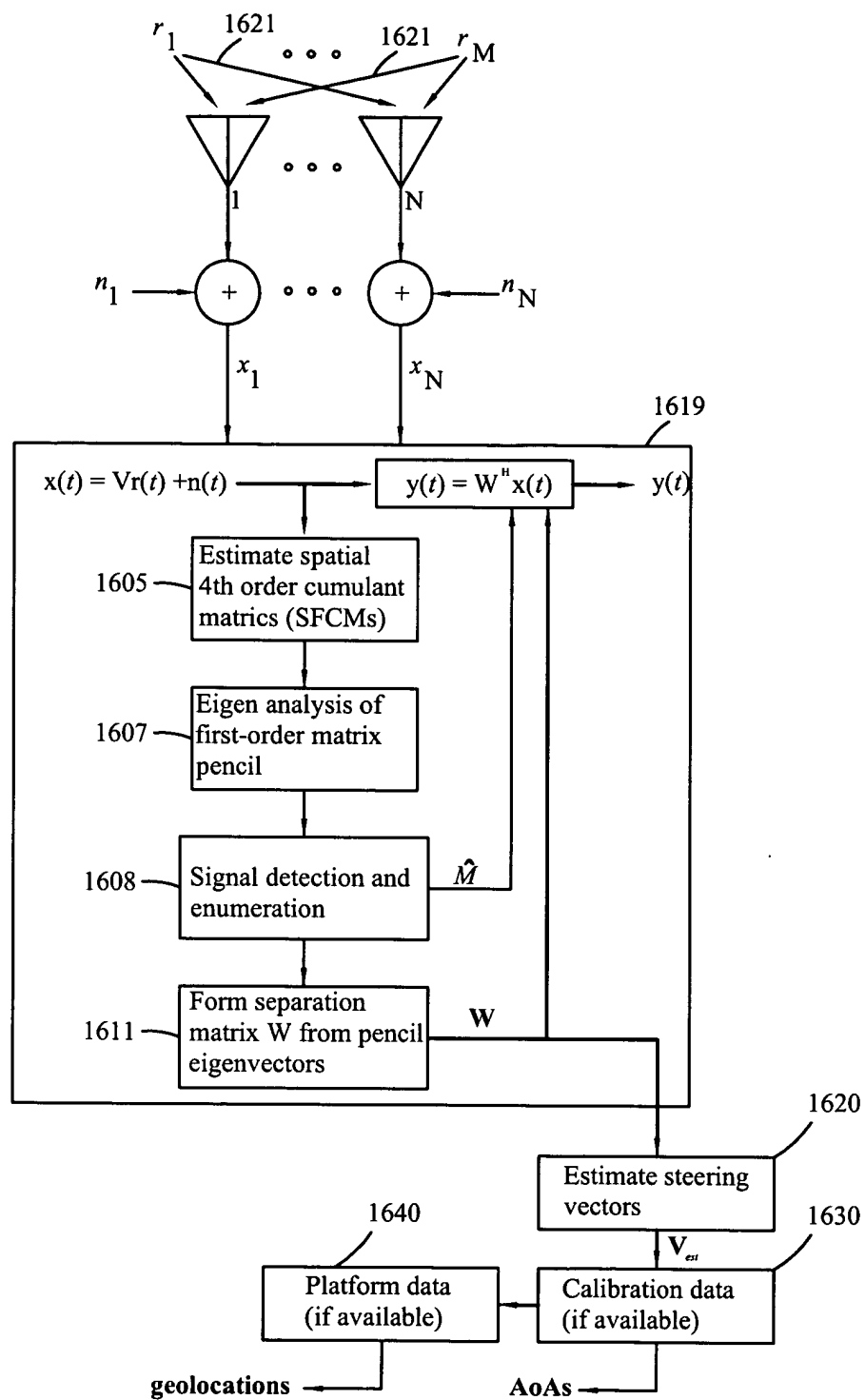


FIGURE 16

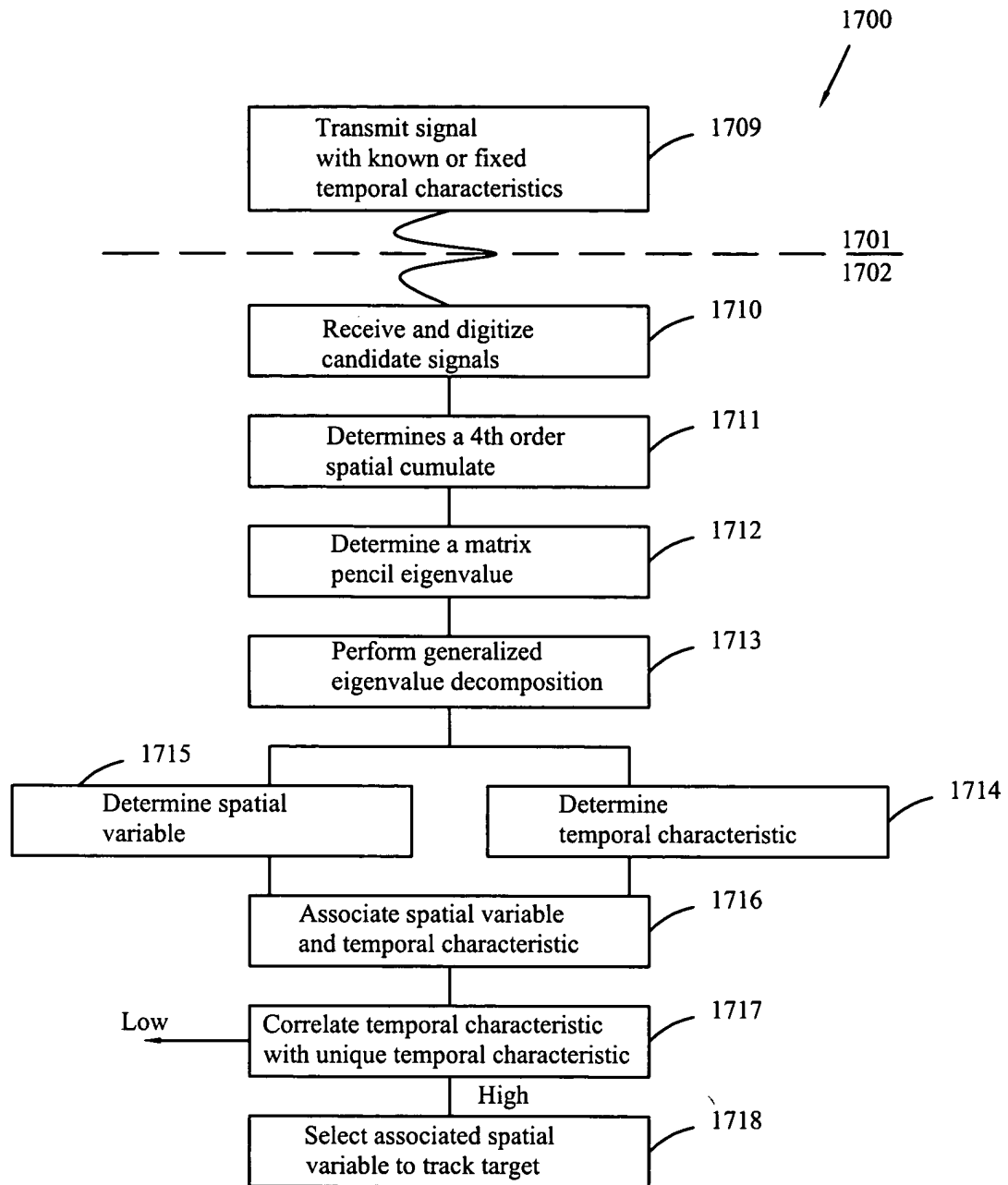


FIGURE 17